DEPARTMENT OF THE NAVY
NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
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MEMORANDUM

FOR THE MEMBERS OF THE TECHNICAL REVIEW COMMITTEE (TRC) FOR INSTALLATION RESTORATION PROGRAM AT NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP) BETHPAGE, NEW YORK

We are pleased to submit a copy to your office of the U.S. Navy's Final Phase 2 Remedial Investigation (RI) Report for Sites 1, 2, and 3 at NWIRP Bethpage, NY. This Final Report has incorporated all appropriate comments from the TRC which were forwarded to this office during the comment period.

Also attached are the Navy's written responses to your individual comments. If there are any major problems or concerns regarding the Navy's response to your comments, please call either myself or Mr. Jack Dunleavy at (215) 595-0567, extension 163 or 152, respectively.

Thank you for your continued participation in NWIRP Bethpage's IR program.

Sincerely,

James L. Colter

JAMES L. COLTER
Remedial Project Manager
by direction of the Commanding Officer

Distribution:
Bethpage Water District, John Molloy
DCMD Northeast, Jim McConnell
DLA/DPRO, Martin Simonson
Geraghty and Miller, Carlo San Giovanni
Grumman Aerospace Corporation, John Ohlmann
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NWIRP Bethpage Phase 2 RI
TRC Comments and Responses

Geraghty and Miller Comments

1. Comment: The overall objective of the Phase 2 Remedial Investigation (RI) is to characterize the nature and extent of environmental contamination. This objective was not fully achieved. The horizontal and vertical extent of contamination detected in Well Clusters HN-24 and HN-29, as well as the vertical extent of contamination detected in the off-site residential area was not defined. As stated in the report, the presence of solvents in production wells beneath the NWIRP site indicates deep (300 to 700 feet) groundwater contamination; the extent of this contamination must be determined, Page 6-1 indicates that groundwater quality data collected during Phase 2 has only defined the aerial (or horizontal) extent of contamination.

   Response: The Navy believes that there is adequate characterization of the aquifer to proceed with the Feasibility Study and the Record of Decision. The maximum depth of contamination is expected to be the Raritan clay layer at approximately 700 feet below grade surface. Based on the production well data and the DNAPL nature of the contaminants, it is likely that groundwater contamination occurs to at least the depth of the production wells (500 to 600 feet bgs).

2. Comment: More detailed site maps and tables are needed to assist in the review/understanding of the data presented in the report. Figures should be provided that identify site features, such as the northern (cinder-covered) former drum marshalling area (page 4-4). In addition, summary tables (for Phase 1 and 2 data) should be provided for well completion details and analytical (soil and groundwater) results. Furthermore, the U.S. Navy should consider the possibility that sporadic detections of inorganic compounds in groundwater samples may be the result of sediment in preserved metal samples. A review of the Phase 2 sample logs indicate that turbidity may have been a problem in groundwater samples collected.

   Response: The Phase 2 RI was developed as an addendum to the Phase 1 report. This data is available to all the TRC members.

   The sporadic detection of several metals in the groundwater results in many cases likely results from turbidity in the wells. Turbidity must be addressed during the startup of any extraction well and as a result the total results are relevant. This concern was a primary reason for collecting both filtered and unfiltered metal results. Soluble metals were also detected in the groundwater at concentrations above drinking water criteria.

3. Comment: In various sections of the report, the recharge basins are identified as a secondary source of VOC contamination. The language used on page 1-9, paragraph 4 to qualify this statement should be used consistently throughout the report. The report should also mention that Grumman has been required (under a SPDES permit) to bring recharge basin discharges into compliance with drinking water standards, and discharges to the on-site recharge basin should meet drinking water standards by the end of the

year. Furthermore, the report should state that current and past pumpage and recharge practices have resulted in hydraulic control (containment) of the groundwater contaminants.

Response: The Navy believes that the references to the recharge basins, as a secondary source of VOC contamination, are necessary to the understanding of contaminant migration.

The following statement will be added to Page 1-9, paragraph 4. "Grumman Corporation, under their existing SPDES permit, is adding a treatment system to the recharge basins by the end of 1993. This treatment system is expected to result in drinking water quality water being discharged to the basins."

The complete containment by the production wells and recharge basins is not completely accurate. Specific information contradicting this statement includes contamination in BWD wells to the south and NWIRP recharge basin water flowing to the east. This statement cannot be added to the report.

4. Comment: The last sentence of the first paragraph on page 2-4 should be deleted.

   Response: This sentence will be deleted.

5. Comment: Page 1-17 should be revised to reflect that treatment is currently being designed for Bethpage Water District Well 4-1.

   Response: The following statement will be added to the first paragraph of Page 1-17. "A treatment system for VOCs is currently being designed for Bethpage Water District Well 4-1."

6. Comment: The last sentence in paragraph 2 on page 1-18 should be revised as follows: This data indicates that a deep solvent contaminant plume exists beneath the Grumman and NWIRP sites.

   Response: The following will be added as indicated. "(and NWIRP)"

7. Comment: Many of the assumptions made during model construction do not correspond to the conceptual framework of Long Island hydrogeology that has been established through previous investigations. Some of these assumptions make the reliability of the model as a predictive tool questionable. The fact that simulated heads match observed heads does not guarantee that the model reproduces real world conditions. The head distribution in the deeper layers should be provided to better document three-dimensional flow patterns. Justification should be provided for the following assumptions to help in our evaluation of whether particle tracking simulations accurately depict adjective movement of contaminants.

   Response: The primary focus of the groundwater modeling section of the Bethpage RI was to design and construct a groundwater flow model which effectively simulated the observed data at the HNUS and GM monitoring wells across the modeled area. Initial values for aquifer parameters (such as horizontal and vertical hydraulic conductivities) were derived from the site-specific data determined from the on-site pumping tests performed in early 1993. These initial values were adjusted during model calibration to accurately match the head data for the observation wells in the modeled area.

Additional maps showing head distribution in model layers 1 through 5 will be provided to better document the three-dimensional flow patterns.

7.a Comment: Why is it assumed that a recharge basin is active near GM-15S? This appears to be a residential area yet the model incorporates a year round recharge rate of 308 gallons per minute (gpm).

Response: HNUS is not certain what exacting is occurring with the water levels at this well. The addition of relatively minor quantities of recharge at this location was selected as the best approach to account for the available information. Specifically, the measured water levels at shallow observation well GM-15S exhibit a sudden water-level increase of 6.56 ft between the months of January and February, 1992. This unusual increase in water level at this well continues at least through September, 1992, as illustrated on Figure 6-1 of FS Appendix F. Apparently, some recharge activity is occurring in the vicinity of GM-15S which is causing these unusual water levels to persist for at least 8 months, including the months of February and August, 1992 which were used for model calibration. To accurately simulate the water levels in this area and the associated groundwater mound this data point creates, recharge water was added to this grid-block. It should be noted that the flow model accurately simulated the water elevation at this well for January, 1992 data (during validation) prior to the beginning of the unusually high water elevations at this well. This indicates that the aquifer parameters assigned for this area are accurate. Overall, because of the location of the well and the depth of the NWIRP-derived water at this point, the assumption of recharge at this location should not impact the usability of the model.

7.b Comment: What are the recharge rates to Hooker-RUCO basins based on? The model simulates a total of over 2,500 gpm going to the Hooker-RUCO basins during high pumping conditions. Where is this water coming from? Are there production wells on Hooker-RUCO property? If this assumption is incorrect and the mounding is due to hydrogeologic factors, then the particle tracking simulations could be misrepresentative.

Response: The recharge basins at Hooker-Ruco receive water from site run-off and from plant activities, as noted in the Hooker-Ruco Draft RI report prepared by Leggette, Brashears & Graham, 1990. Hooker-Ruco Sump 2 is used for storm water runoff management, Sump 3 collects surface runoff from a large portion of the developed plant site, and Sump 4 is used for periodic non-contact cooling water discharge. Both Sumps 3 and 4 contain standing water. The recharge rates used for the Hooker-Ruco basins were based on modeled versus measured water elevations at observation wells near these recharge basins, which showed consistently low modeled head in the vicinity of Hooker-Ruco property which may have been the result of recharge at these basins. Recharge was added to account for these patterns. For comparison, 4,000 gpm was being recharged at the NWIRP basins under this scenario.

7.c. Comment: The north and south constant head boundaries are a major controlling factor on the head distribution in areas away from pumping and recharge. Observed data from nearby well clusters should be cited to justify the change in head with depth that occurs in these areas. The values input at constant head nodes do not fit the conceptual model of the head distribution in the area. What is the justification for the large decline in head (about 4 ft) between Model Layers 2 and 3 at the northern constant head boundary? The thickest sequence of Magothy deposits are in Model Layers 3, 4, and 5, yet the change in head between Layers 3 and 5 is only 0.2 ft. Setting up vertical gradients with unrealistic constant head boundaries will greatly influence the particle tracking analysis of the source of water to the production wells.

Response: Initial north and south constant head values were derived from site-specific data and literature sources, and final values were determined during steady-state calibration of the model. Limited data is available on heads at depth along the north or south constant head boundary, as no deep wells are present in these regions. Shallow, intermediate and deep monitoring well data from wells located within the NWIRP show a range of up to 4.26 ft of head change between shallow and deep wells. Similar data is seen in the southern portion of the model grid, with ranges of shallow to deep wells having head differences of up to 2.51 ft for the October 1991 to September 1992 data sets. The change in constant head elevations between model layer 1 to model layer 3 that were used in the model (up to 4.95 ft for the north constant head boundary and 1.85 feet for the south constant head boundary) are close to, or within the measured head changes seen at shallow and deep observation wells. Therefore, the constant head elevations used in the model reflect measured head data from within the modeled area.

7.d Comment: The hydraulic conductivity values and distribution used in the model should be justified since it is contrary to previous investigations on Long Island. Figure 6-20 shows that a value of 57 ft/day was used for glacial outwash deposits, when an average value of 270 ft/day is the generally accepted estimate. The vertical hydraulic conductivity of the Magothy aquifer is much higher than estimates from previous investigations on Long Island.

Justifications should be provided for the vertical hydraulic conductivity zonation illustrated on Figures 6-22 and 6-23.

Previous hydrogeologic investigations have shown that the basal Magothy aquifer is about 75 ft thick and has a hydraulic conductivity much lower than the 200 ft/day used in the model. In addition, Model Layer 5 is about 220 ft thick, which would mean that the base Magothy comprises about 1/3 of this layer. The anistropy ratio of about 4 to 1 is unrealistically high for this unit.

Response: The hydraulic conductivity values used in the model are based on pumping test results which were conducted on NWIRP property. The results obtained from these pumping tests represents data collected in the immediate area of concern. Literature values may represent more generalized (regional) values. As seen in Table 1, the horizontal conductivity values used in the calibrated model are within values determined during the on-site pumping test. Vertical conductivity values are close to those values determined from the pumping test. In addition, layer 1 of the model contains approximately equal portions of the upper glacial aquifer and the upper-most Magothy aquifer. The upper portion of the Magothy is likely to have lower horizontal and vertical hydraulic conductivities than the upper glacial aquifer. The hydraulic conductivity values used in model layer 1 represents a composite of both the upper glacial and the upper-most portion of the Magothy aquifer, and therefore will be lower than values for the upper glacial aquifer alone.

Table 1
Range of horizontal and vertical hydraulic conductivity values

Literature Values for Upper Glacial Aquifer		NWIRP Pumping Test Data (Shallow Observation Wells)		Calibration Values for Model Layer 1	
K (ft/d)	Vk (ft/d)	K (ft/d)	Vk (ft/d)	K (ft/d)	Vk (ft/d)
up to 270	27	41 to 144	23.36	57 to 98	10 to 15

The zonation of vertical hydraulic conductivity illustrated in Figures 6-22 and 6-23 were determined during model calibration. Specifically, drawdown from production well activity in this region was causing increased drawdown in model simulations. Vertical hydraulic conductivities were reduced in this area to decrease the amount of modeled drawdown at observation wells within the reduced vertical hydraulic conductivity zones.

The highly conductive portion of the lower magothy aquifer may be the dominant pathway for groundwater movement due to it's significantly higher conductivity. Pumping test #2 was conducted by pumping from a deep production well which is screened in layer 5 and indicated a conductivity of approximately 85 ft/day, which is approximately half of the calibrated value used for this layer. While an exact match of measured and final calibration values of hydraulic conductivity is desirable, it is rarely achieved in practice. The range of two times the measured value of horizontal hydraulic conductivity was considered adequate.

7.e Comment: The simulated water-table contours depicted on Figures 6-6 and 6-7 suggest that there are problems with the model construction. Why are there two 62 ft contours at the southern boundary in Figure 6-6? How can you infer the 64 ft and 62 ft contours when there is no observed data?

Response: The south constant head boundaries for model layer 1 have been changed to eliminate the southern-most 62 ft. contour line. The elevations of the south constant head boundary was decreased by 0.4 ft for the February simulation and by 0.3 ft for the August simulation to allow the southward exit of water from the model grid from this layer. All other southern constant head elevations in model layers 2 through 5 remain unchanged from calibrated values. The small change in constant head elevation effects only the southern most row of the model, and does not effect the quality of the model calibration. Contour maps of layer 1 through layer 5 model heads are identical before and after these changes. In addition, particle tracking pathways which show particles moving through all five model layers are identical before and after these changes. Figures 6-6 and 6-7 will be amended to reflect these changes.

The 62 and 64 ft contours on figures 6-6 and 6-7 are labeled as inferred contours, because there are no monitoring wells in these areas. Despite the lack of monitoring wells in this area, it is likely that the 62 ft and 64 ft contour lines are present in this portion of the study area. Question marks will be added to these contours to indicate that the exact position of these contours is not known, although their general location can be approximated.

8. Comment: The aquifer tests could not be properly evaluated because documentation was incomplete. The pumping rates of the production wells during the tests should be provided, and any changes in the pumping rates of these wells during the test should be documented. The trend data suggest that steady-state conditions did not exist when the test was initiated.

   Response: As stated in the text of the RI report, the pumping rate for pumping test #1 was erratic prior to, and approximately 10 minutes into, the pumping test, and was constant after this time, pumping at a rate of 448 gpm. The pumping rate for pump test #2 was consistent at 890 gpm for the majority of the pumping test, although some small pumping rate fluctuations were noted at 1200 minutes (rate = 925 gpm for 200 minutes) and at 3900 minutes (rate = 960 gpm for 100 minutes). A complete listing of the measured pumping rate for each pump test will be provided. As discussed in Appendix E, the aquifer was considered to be in a quasi-steady state condition. The absence of a true steady state condition should not affect the usability of the data.

   Curve matching points and a complete listing of water levels in all monitoring wells measured during both pumping tests are provided in Appendix E.

Page/Site-Specific Comments:

1. Comment: Site 1: Statements made on page 4-4 about the hydraulic locations of Wells HN-27S2 and HN-27S3 contradict the locations shown on Figure 2-6. Based on Figure 2-6 and the reported south/southwesterly direction of groundwater flow, Well HN-27S2 is upgradient of Well HN-27S3. This would make the upgradient well (HN-27S2) more contaminated than the downgradient well (HN-27S3).

   The horizontal and vertical extent of groundwater contamination south and west of Well Cluster HN-29 (the most contaminated well in Site 1) is not defined.

   It is unclear why two separate parameter lists were used to report the HNUS and Geraghty & Miller data that is summarized on Figures 4-4 and 4-5.

   Analytical results for some of the soil samples (see Appendix H) collected from Sites 1 and 2 are quantified as unreliable. Geraghty & Miller is not familiar with this notation, but if it corresponds to USEPA's notation for "rejected" data, then the data cannot be used for assessing site impacts. Furthermore, the report lacks a statement indicating if data completeness criteria have been met and, if not, whether resampling will be conducted.

Response: The figure is correct for HN-27S2 and HN-27S3. The text will be corrected. The downgradient monitoring well is the more contaminated well.

The horizontal extent of contamination in HN-29 is well defined in the horizontal direction by Navy and Grumman wells. The vertical extent of contamination is also fairly well developed with the boundary for VOCs less than 100 ug/l occurring between the water table and the depth of the intermediate well (the selected criteria under the preferred alternative). Also, because of the DNAPL nature of the VOCs, the action of the production wells, and measured contamination in production wells, contamination extends to 500 to 600 feet below grade surface. The Raritan clay layer is present approximately 100 feet below these production wells. The contamination may or may not extend to this depth, but it would not be expected to penetrate this clay layer.

The two separate parameter lists were developed based on the information available at the time. Since the three VOC compounds (TCE, PCE, and TCA) used for the Grumman wells represent the majority of the contamination, the use of all VOC data would not change the conclusions.

No data was classified as unreliable. Because of poor surrogate recovery, non detects are considered potentially unreliable. Positively detected data was presented as estimated for this same reason. A validation letter presented in Appendix I discusses this.

A statement will be added to Section 4.8 that the data completeness criteria has been achieved.

2. Comment: Site 2: What is the reference (source) for the statement made on page 4-12 that "Oil, potentially used for dust control, is a potential mechanism for spreading PCBs along the earthen roads."

   Response: The statement is based on the observed PCB distribution on and near roadways, and common knowledge that oils are routinely used for dust suppression on roads.

3. Comment: HN-24 Area: What is the reference (source) for the statement made on page 1-11 that "Solvents may have been applied to the coal."

   HNUS should investigate the DNAPL theory presented on page 1-11 by looking for a separate (sinking) phase of product in Well HN-24I or the adjacent production wells.

   In several places in the report, it is stated that TCE detected in Well HN-24I was "associated" with a 10-foot thick clay layer. However, since TCE was detected in the clay 2 to 3 orders of magnitude below that detected in the groundwater sample, it does not appear that the presence of the clay is related to the detection of TCE in the groundwater. In addition, TCE was detected at a similar concentration in Well HN-24I2 and the clay layer was not encountered at this location.

The vertical extent of the contamination detected at Well HN-24I was not determined.

The location of Well HN-24I3 is not shown on Figure 2-6.

Response: The statement linking coal to solvents is based on verbal reports of this practice occurring at another nearby Grumman/Navy facility.

To observe a DNAPL in a monitoring well, a confining layer (clay) immediately underneath the well would be required, otherwise, the DNAPL would continue to sink. This geological condition is not present in any of the wells referenced.

Both the high solvent concentration and the clay layer were found at HN-24I2. Neither clay or high solvent concentration were found in HN-24I1.

The Navy believes that the vertical extent of contamination at this location is adequately determined. Based on production well data, contamination extends to 500 to 600 feet bgs.

Well HN-24I3 is actually identified as HN-43. The location of this well is presented on Figure 2-7.

4. Comment: The constant head boundary on page 4-7 was initially determined from a water-table map in Smolensky and Feldman (1990). However, the southern boundary was 55 ft. in the above referenced report, not the value of 62 ft. used in the model.

   Response: The constant head boundary was originally derived from Smolensky and Feldman (1990) using the elevation of 55 ft, which was based on April, 1986 data. The values of 61 to 62 feet were determined during model calibration to more accurately reflect measured elevations during February and August, 1992. Based on the available information, 61 to 62 feet most accurately reflects the groundwater elevations in 1992. The use of 55 feet may have been accurate in 1986.

5. Comment: One-half of the average annual precipitation is 22.29 in/yr, not the 24.34 in/yr that was cited in the report on page 4-8.

   Response: The precipitation rate used in the model was 22.29 in/yr, not the value of 24.34 in/yr listed in the text. The text of the report will be changed.

6. Comment: On page 7-1, the model validation with a data set from the month previous to the calibration data set does not demonstrate the effectiveness of the model as a predictive tool.

   Response: The months of January and July represent good choices for model validation and demonstrate the effectiveness of the model as a predictive tool. As discussed in the text of the RI report, January and July, 1992 data was chosen for model validation because these months and the two months used for calibration have similar amounts of precipitation. Using months in the same season with similar amounts of precipitation for both model calibration and model validation is necessary because the total precipitation will effect the water elevations at the northern and southern constant head boundaries. Significant changes in constant head boundaries will effect water elevations across the modeled area.

In addition to the similar constant head elevations, the months of January and July were chosen for validation because the pumping rates of several production wells exhibit a significant difference between January and July, and February and August. For example, a comparison of production well pumping rates for calibration and validation (Tables 6-4 and 7-1) indicates that PW-1, PW-3 and PW-11 have significantly different pumping rates for January and February, 1992. A similar difference is present in the pumping rates of production wells PW-1, PW-6, PW-13 and PW-15, which exhibit significantly different pumping rates when comparing July and August, 1992 pumping rate data. These differences in production well pumping rates, and the associated recharge basins discharge rates allow for the model to predict head in response to changing pumping conditions at production wells and recharge basins.

7. <u>Comment</u>: Much of the text (for example, page 8-4) evaluates particle movement in terms of the percent of particles that reach the various discharge points. What is the significance of this if it does not correlate to the percentage of flow reaching the discharge points?

   <u>Response</u>: Particle tracking simulations were included to demonstrate if it is possible for particles that were released from potential contaminant sources to reach a potential location, such as a pumping well, under the specified pumping conditions. The particle tracking simulations were not attempting to equate the percentage of particles reaching a discharge location with the percentage of flow or contaminant concentrations at that discharge point.

8. <u>Comment</u>: Table 8-3 indicates that particles released from the basins do not terminate at BWD wells during current conditions. However, Figure 8-3 shows that they either terminate, or are strongly influenced by BWD wells.

   <u>Response</u>: The particles which are released from the basins do not terminate at BWD wells during current conditions. The pumping activity at these wells creates a cone of depression which deflect particle movement towards these wells, although no particles are captured by these wells.

NYSDEC Comments

1. Comment: Sections 1.1 and 1.2: In these sections, references to the RI/FS and the Navy's IR programs are made. In so doing, the various stages of both programs are referred to as Phases (Phase 1, Phase 2, etc.). This may be a bit confusing to the general public. A possible editorial change might be to refer to the stages of the IR Program as "Steps" or "Stages".

   Response: Terminology under the Navy's IR program will be changed to stages.

2. Comment: Page 2-4, the first two sentences on this page should read:

   > "The NWIRP-Bethpage site is listed in the registry entitled "Inactive Hazardous Waste Disposal Sites in New York State" as site number 1-30-0003B. This site is not listed on the EPA's National Priorities List (NPL) at this time; although it is expected that this site will be listed on the NPL sometime in 1994."

   Response: The first sentence is acceptable and will be modified as indicated. Because the CERCLA status of the site is unknown, the second sentence can not be modified at this time.

3. Comment: Section 3.2.3: In the second paragraph of this section, it states:

   > "The water table beneath the NWIRP was found only within the Magothy Formation."

   This summer has been very dry, and, as a result, the water table has dropped significantly. The above statement is probably correct considering present conditions.

   Under normal precipitation scenarios, the water table over much of the site, particularly Site 1, is within the Upper Glacial Formation according to the USGS (attached is a copy of Figure 12 from the first USGS report). This should be factored into the computer model which was developed for this site (if this hasn't already been addressed).

   Response: This issue has been addressed in the computer modeling.

4. Comment: Page 4-16, Section 4.2.1: At the top of the page it states:

   > "The third recharge basin sediment was not sampled since it has been recently skimmed."

   In retrospect, it should have been sampled. The result may have helped us determine how the PCBs got into the sediments.

   Grumman and the Navy should try to determine how the PCBs got into the sediments of recharge basins on both sides. Corrective action must be implemented if current activities are the cause of this contamination.

Response: The third recharge basin had been targeted to be sampled, but sampling was not possible because the sediments were removed. It is our understanding that the recharge basins are used for similar waters and that they are skimmed on a regular basis. As a result, it is likely that results from the two basins sampled are similar to the third.

Because these basins receive storm water from various locations at the facility, it is likely that the PCBs detected in the sediments are derived from PCB contaminated soils found at areas such as Sites 1 and 2. The PCBs would be carried with the storm water during precipitation events. Once in the basins, the PCBs would settle out throughout the basin. Interim corrective action to minimize PCBs entering the basin has already occurred with the covering of the PCB hot spot at Site 1. Future actions addressing PCBs would further reduce PCBs entering the basins.

5. Comment: Table 4-8: It is the understanding of the Department that the vinyl chloride concentration in Well #14 in 1993 was 1400 ppb. This entry in the table needs to be clarified.

   Response: The correct result is 1,400 ug/l. The table will be fixed.

6. Comment: Table 4-12: The temporary wells are labelled as R-01, R-02, etc., in the table and as TW-01, TW-02, etc., in the next text. This needs to be clarified.

   Response: The text will be revised to used the "R" designations.

7. Comment: Section 5.3.5: As stated in Comment #3 above, the water table over much of the site, and especially the Site 1 source areas, is probably within the Upper Glacial Formation (per the USGS). This may or may not affect the design of a pump and treat system in the Site 1 area. (**NOTE**: Modifications to the computer model, etc., can be made during the design phase of this project.)

   Response: This comment is noted.

8. Comment: Section 5.2.6, paragraph 4: Modelling results for Wells 7D and 8S may not have fallen within the +/-2.0 ft. criterion because they are located near a pumping center and recharge basins, respectively.

   Response: Although it is possible that these wells are affected by the recharge, it is HNUS judgement that the wells are far enough from the recharged basins so as to not be affected. Overall, minor problems at these locations are not considered significant.

9. Comment: Page 5-11: At the top of the page it states:

   > "Three recharge basins were considered to be active on Hooker-Ruco property, recharging the aquifer at a rate of 202 gpm per basin (the rate determined during model calibration)."

Response: This rate was determined during the model calibration to account for apparent groundwater mounding in this area.

10. Comment: Section 5.2.9 and Appendix E: The Department reserves comment at this time. We are still evaluating the data and analysis. A conference call with Halliburton-NUS staff may serve to answer the DEC's questions.

    Response: This comment is noted.

11. The piping for the storm sewers discharging to the recharge basins (Site 2) should be investigated. Sampling of soil/sediment at all inlets should be performed to determine if storm run-off and sediments are continuing to release hazardous constituents to the groundwater and surrounding soil.

    The sanitary sewers (Nassau County) should be checked for leaks (if this isn't routinely done) and samples should be collected where leaks are detected.

    (**NOTE**: These tasks can be conducted during the design phase of this project.)

    Response: The intent of the IR Program is to address historic activities at the facilities and/or those which are not being addressed by other programs. The Site 2 recharge basins were addressed during the RI and FS because of their potential to be historic source areas.

    It is likely that chemicals are being conveyed via storm water transport from the contaminated soils to the recharge basins. However, it is our understanding that Grumman Corporation, through their SPDES permit, regularly monitors the quality of the water entering the basins and takes action as required. For example, because of VOC contamination in the water, Grumman is in the process of providing aeration for VOC removal. Also, Grumman regularly removes basin sediments (fines). The removal of these fines would be expected to address contaminants such as PCBs and metals entering the basins.

    Similarly for the sanitary sewers, it is our understanding that these sewers are also covered under an existing permit. Also, because of the nature of sanitary wastewater, there is no reason to expect the presence of hazardous constituents which would represent a risk to the groundwater. Industrial wastewaters are segregated and treated prior to discharge to the sanitary sewer system.

12. Comment: The NYSDOH comments will be sent under a separate cover letter.

    Response: This comment is noted.

U.S. EPA Comments - CERCLA

1. Comment: Page 4-1, Section 4.1.1 and Page 4-12, Section 4.1.4: If Aroclor 1242 is considered, three locations rather than the stated two exceed 10 mg/kg PCBs. Table 4-1 indicates that location 105 contained 25 mg/kg of Aroclor 1242.

   Response: The text (and Figure 4-1) will be modified to reflect that PCBs in soils at three areas in Site 1 exceed 10 mg/kg.

2. Comment: Page 4-43, Table 4-13: Why is 1,2 Dichloroethene shown in this table when no samples appear to contain this contaminant?

   Response: 1,2 DCE will be deleted from this table.

3. Comment: Page 6-6, Section 6.5.2, The second sentence of the second paragraph should include the calculated risk for the incidental ingestion exposure route.

   Response: The statement "and 3.9×10^{-7}" will be added to this sentence.

4. Comment: Page 6-7, Table 6-3: There appears to be an error in reporting the risk for the onsite worker from dermal contact using the revised PCB data. The table reports the risk as 9.8×10^{-5} while the text reports the risk as 9.8×10^{-6}. The table and text should be reconciled.

   Response: The correct risk value is 9.8×10^{-6}. The table will be revised.

U.S. EPA - RCRA

1. Comment: Section 4.7.3, Page 4-45: This paragraph mentions that the lower groundwater aquifer contamination is likely coming from the recharge basins. However, there is no mention of this conclusion in the "Recharge Basin Section" in Section 4.2 on page 4-12. Please provide some type of tie-in between these two sections.

   Response: The conclusion was not made in Section 4.2 because no groundwater testing was conducted at Site 2 during the Phase 2 RI. A references to Section 4.7 (Offsite groundwater) will be added to Section 4.2.

2. Comment: Section 1.4.2, Page 1-9, 2nd paragraph under "Conclusions": This paragraph mentions that the VOC's in the recharge basins are likely resulting in partial treatment due to volatilization. The EPA does not consider natural volatilization as a type of "treatment" for groundwater contamination.

   Response: Because the term "treatment" has a very focused definition under EPA use, the sentence will be reworded as follows. "..., the system likely resulted in lowering of VOCs in groundwater by natural volatilization."

NYS Department of Health

1. Comment: The text indicates that the coal stored in the area HN-24 could have been sprayed with solvents to suppress dust generation. It is occurred, that potential for mobilization of chemical constituents of the coal such as poly aromatic hydrocarbons PAHs is increased. Unless it can be determined that the practice of "wetting" the coal with solvents did not occur. The sampling of soils and groundwater for analysis of semi-volatile contamination is needed.

   Response: During the Phase 2 RI, subsurface soil samples in the area of the former coal pile were specifically tested for VOCs as an indication of this practice. The results of this testing did not indicate that solvents were applied to the coal in this area. If solvents were not applied, then PAHs would not be expected to be present.

2. Comment: Table 1-1 should show how many samples were collected for each of the years data were reported. It is my understanding that the Bethpage Water District collects one sample per month from each of their supply wells. Table 1-1 or the corresponding text does not describe how many samples were actually collected.

   Response: Because of the likely variation in sampling events between the various wells and the use of the data, a more general statement is planned. The following statement will be added as a footnote to Table 1-1. "Data presented is the maximum result reported for that year based on regular sampling events."

3. Comment: The text on Page 2-6 describes the Stage 1 soil-gas survey. It indicates that OVA was used during the Stage 1 soil-gas survey. The contaminants of concern in this survey included chlorinated solvents, which the OVA may not be very responsive to. The text on these pages should provide information on the applicability of using an OVA, including the detection limit and sensitivity of the instrument to the contaminants of most concern, (trichloroethene, 1,1,1-trichloroethane, tetrachloroethene).

   Response: The relative response ratios for these three chemicals of concern are 0.7 to 1.05, which are more than adequate for the testing conducted. A comparison of Stage 1 and Stage 2 data found a good correlation.

   The detection limit for an OVA is approximately 0.1 to 1.0 ppm. Since background soil gas under the building was estimated to be 2 to 10 ppm, the detection limit is not as significant as it would be under other situations. Additional discussion of the Stage 1 soil gas testing and rationale is provided in Appendix A.

4. Comment: The titles of Figures 2-1, 2-2, and 2-3 should be clarified to indicate if they are Stage 1 or Stage 2 sampling locations.

   Response: The description of "Stage 1" and "Stage 2" will be added to these figures.